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EXAMINER	
VAN DOREN, BETH	

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3623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

SW

Office Action Summary	Application No. 09/491,461	Applicant(s) DAGUM ET AL.
	Examiner Beth Van Doren	Art Unit 3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6) ☐ Other: .

DETAILED ACTION

1. The following is a non-final, first office action on the merits. Claims 1-21 are pending.

Specification

2. The abstract is too long. Correction is required.

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of:

(1) whether the invention is within the technological arts; and

(2) whether the invention produces a useful, concrete, and tangible result.

For the claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e. abstract idea, laws of nature, natural phenomena) that do not apply, use, or advance the technological arts fail to promote the

"progress of science and the useful arts" (i.e. the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For a process claim to pass muster, the recited process must somehow apply, involve, use, or advance the technological arts.

In the present case, claims 1-21 only recite an abstract idea. The recited steps of merely modeling a mathematical relationship and performing a mathematical analysis to solve the relationship does not apply, use, or advance the technological arts since all of the recited steps can be performed without the use of technology. Therefore, since claims 1- 21 only constitute an abstract idea of how to setup and manipulate a mathematical expression, and since the claims do not apply, involve, use, or advance a technological art, it is respectfully submitted that the claimed invention is directed towards non-statutory subject matter.

Additionally, for a claimed invention to be statutory, the claimed invention must also produce a useful, concrete, and tangible result. In the present case, the invention of claims 1-21 produces and manipulates a mathematical expression to produce optimal levels of resources.

Although the recited process produces a useful, concrete, and tangible result, since the claimed invention, as a whole, is not within the technological arts as explained above, claims 1-21 are deemed to be directed towards non-statutory subject matter.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10, 12, 14, and 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Dietrich et al. (U.S. 5,630,070).

6. As per claim 1, Dietrich et al. teaches a method for optimizing a multivariate representation of resources which are used in producing a set of products, the resources, products and their respective connectivities being represented in a product space plan, the method comprising:

converting an expected value function associated with the resources and products into a closed form expression (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein an expected value function is formed for the resources and products. The expected value function is transformed into a closed form expression so it can be solved);

transforming the product space plan into a working transformed space plan, wherein the products are transformed into working elements (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the connections and relationships between products and resources represent a product space plan and this plan becomes a working plan in the equations created. The products become the variables that are worked in the equations);

performing a load step to form elemental blocks as a function of a single variable with elements being loaded with resources that gate production of the elements (See at least figures 7-

10, column 4, lines 15-40, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40, wherein a variable, such as eggs, is loaded with a value that represents the resources available. The available resources constrain the production of the elements (or products));

performing a re-loading step to form elemental blocks as a function of a single variable with elements being reloaded with resources that gate production of the element (See at least figures 7-10, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40, column 14, lines 15-26, and column 15, lines 1-15, wherein reloading occurs that adds product blocks in equations that represent the subassemblies, each equation a function of a single variable);

solving for the maximum of each elemental block over each associated single variable (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations are optimized based on constraints and preferences and the maximum of each product associated with the variables is determined for the wanted outcome (for example, lower costs, higher profit, etc.)); and

determining the optimum level of resources as a function of the solved for maximum (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations are optimized based on constraints and preferences and the maximum of each product associated with the variables is determined for the wanted outcome (for example, lower costs, higher profit, etc.)).

7. As per claim 2, Dietrich et al. discloses a method wherein the loading and re-loading steps result in an equilibrium configuration that provides the minimum amount of resources to produce any given amount of products across the whole plan (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the result of the loading and reloading produces an equation which is solved in an effort to reduce costs and use the minimum resources to satisfy the constraints).

8. As per claim 3, Dietrich et al. discloses a method wherein the loading step further includes:

sequentially looking at each present work element (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein each present product is looked at);

determining if each associated resource gates production of the element (See at least column 7, lines 5-25, column 8, tables 1-4, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein it is determined what resources control production of the product and are needed to produce the product at the needed demand);

if gating occurs, then unloading the resource from a prior element if so loaded, and loading the resource onto the present element (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein during the maximizing of the

equations, resources are shifted and loaded onto some elements and taken from other elements based on the demand and associated constraints of the equations).

9. As per claim 4, Dietrich et al. discloses a method wherein the reloading step further includes:

sequentially looking at each present work element (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein each present product is looked at);

reloading each unloaded resource back onto the element (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome);

redetermining if the element is gated by each reloaded resource (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome);

if the element is so gated, then merging the elements sharing each gating resource into a common elemental block which is a function of a single variable (See column 2, lines 60-67, and column 7, lines 5-25, which talks about products with common subassemblies).

10. As per claim 5, Dietrich et al. discloses a method wherein step of determining that gating occurs includes calculating a new maximum for the loaded element and determining if any remaining components further gate the maximum (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome).

11. As per claim 6, Dietrich et al. discloses a method wherein the step of redetermining that gating occurs includes recalculating a new maximum for the reloaded element and determining if any remaining components further gate the maximum (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome).

12. As per claim 7, Dietrich et al. discloses a method wherein the step of merging the elements results in an elemental block that is a sub-plan of the overall plan, but which is a function of a single variable (See at least column 2, lines 58-67, column 6, lines 25-60, and column 7, lines 9-25, which discusses subassemblies that are sub-plans of the overall plan. See also at least columns 15 and 16, which discusses multi-period problems that show different

periods as sub-plans of the overall plan. These multi-period results and loadings are merged together).

13. As per claim 8, Dietrich et al. discloses a method wherein the merged elements intersect at a common resource in the transformed spaces (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the equations intersect at a common resource for which the equations are solved).

14. As per claim 9, Dietrich et al. discloses a method wherein the expected value function represents a statistical expectation of the value function at a given resource allocation and for a given demand distribution (See at least column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 8, tables 1-4, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 30-50 and 65-67, column 12, lines 1-20, wherein the expected value function is a mathematical expectation of the function at a known resource allotment at a given demand (the demand and resources available are known and used to manipulate the function)).

15. As per claim 10, Dietrich et al. discloses a method wherein the transforming step involves taking a transformation of the product space to provide the working transformed space wherein the distribution induced on the resources is transformed into a distribution with zero mean and unit variance (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein

the connections and relationships between products and resources represent a product space plan and this plan becomes a working plan in the equations created. The products become the variables that are worked in the equations. In order to solve the equations, the distribution of the resources must have a mean of 0 and unit differences).

16. As per claim 12, Dietrich et al. teaches a method for optimizing a multivariate expected value function which represents a statistical expectation of the value function at a given component allocation and for a given demand distribution, the method comprising:

forming a plan in the product space associated with the expected value function which represents products, components, and connectivities therebetween (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein an expected value function is formed for the resources and products. See at least figure 7 that shows the connectivities);

transforming the product space plan to form a corresponding working space plan, with products corresponding to elements such that the distribution induced on the resources is transformed into a distribution with zero mean and unit variance (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the connections and relationships between products and resources represent a product space plan and this plan becomes a working plan in the equations created. The products become the variables that are worked in the

equations. In order to solve the equations, the distribution of the resources must have a mean of 0 and unit differences);

converting the associated expected value function into a closed form expression (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein an expected value function is formed and the expected value function is transformed into a closed form expression so it can be solved);

performing a load step which loads each element with components that gate production of the element (See at least figures 7-10, column 4, lines 15-40, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40, wherein each product is loaded with variables representing resources that control the outcome of the product);

performing a re-loading step which reloads components that were unloaded from an element in the loading step (See at least figures 7-10, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40, column 14, lines 15-26, and column 15, lines 1-15, wherein subassemblies are reloaded as components);

merging elements that are further gated by components that were unloaded, with the loading, reloading, and merging steps resulting in an equilibrium configuration (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations produced are an equilibrium configuration); and

solving the equilibrium configuration to determine the optimization of the expected value function (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations are optimized based on constraints and preferences and the maximum of each product associated with the variables is determined for the wanted outcome (for example, lower costs, higher profit, etc.)).

17. As per claim 14, Dietrich et al. teaches a method wherein the multivariate demand distribution includes a multivariate normal distribution (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the multivariate demand distribution of Dietrich et al. is a normal distribution. See column 8, table 2).

18. As per claim 16, Dietrich et al. teaches a method wherein the loading step includes:

sequentially analyzing each element in the plan (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein each present product is looked at);

determining if each associated component gates production of the element (See at least column 7, lines 5-25, column 8, tables 1-4, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein it is determined what resources control production of the product and are needed to produce the product at the needed demand);

if gating occurs, then unloading the component from a prior element if so loaded, and

loading the component onto the present element (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein during the maximizing of the equations, resources are shifted and loaded onto some elements and taken from other elements based on the demand and associated constraints of the equations).

19. As per claim 17, Dietrich et al. teaches method wherein the reloading includes:

sequentially analyzing each element in the plan (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, wherein each present product is looked at);

reloading each unloaded component back onto the element (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome);

redetermining if the element is gated by each reloaded component (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein optimization in the equations is based on constraints and iteratively trying different values of the variables in the equations in an effort to satisfy all the constraints and maximize/minimize the overall outcome).

20. As per claim 18, Dietrich et al. discloses a method wherein the equilibrium configuration includes configuring of the plan into elemental blocks which are a function of a single variable (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations produced are an equilibrium configuration which are each a function of a single variable, x).

21. As per claim 19, Dietrich et al. teaches a method wherein the elemental block is maximized over this single variable (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations are optimized based on constraints and preferences and the maximum of each product associated with the variables is determined for the wanted outcome (for example, lower costs, higher profit, etc.)).

22. As per claim 20, Dietrich et al. teaches a method wherein the optimum level of components to support the maximization are derived from the maximized elemental values (See at least column 7, lines 5-25, and column 8, table 1, wherein a vegetable omelet, for example, is vegetables and a plain omelet, and by maximizing products with subassemblies contained therein one maximizes and can determine the maximized resources as well).

23. As per claim 21, Dietrich et al. teaches a method for optimizing the multivariate amount of refinements produced from a level of resources, the method comprising:

configuring the refinements and resources in a representative refinement space plan that accounts for connectivities therebetween (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines

11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein a space plan that accounts for the relationships between refinements and resources is created. See at least figure 7 that shows the connectivities);

deriving an expected value function for the refinement space plan (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein an expected value function is formed);

converting the expected value function to a closed form expression (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the expected value function is transformed into a closed form expression so it can be solved);

transforming the refinement space plan into a working space plan, with the refinements represented by transformed elements (See at least figures 7-10, column 3, lines 50-65, column 4, lines 15-40, column 6, lines 25-35 and 40-60, column 7, lines 6-25, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, wherein the connections and relationships between products and resources represent a product space plan and this plan becomes a working plan in the equations created);

sequentially loading each element with resources that gate production of the element (See at least figures 7-10, column 4, lines 15-40, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, column

13, lines 1-11 and 32-40, wherein each product is loaded with variables representing resources that control the outcome of the product);

sequentially re-loading components that were unloaded from elements in the loading step (See at least figures 7-10, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40, column 14, lines 15-26, and column 15, lines 1-15, wherein subassemblies are reloaded as components);

merging elements that are further gated by components that were unloaded, with the loading, reloading, and merging steps resulting in an equilibrium configuration (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations produced are an equilibrium configuration); and

solving the equilibrium configuration to determine the optimization of the expected value function (See at least figures 7-10, column 3, lines 55-65, column 4, lines 15-40, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-45, column 14, lines 15-26, and column 15, lines 1-15, wherein the equations are optimized based on constraints and preferences and the maximum of each product associated with the variables is determined for the wanted outcome (for example, lower costs, higher profit, etc.).

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dietrich et al. (U.S. 5,630,070).

25. As per claim 11, Dietrich et al. discloses a method wherein the transforming step includes transforming and manipulating a matrix (See at least figure 8, column 4, lines 15-40, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40). However, Dietrich et al. does not expressly disclose using an inverse Cholesky transformation.

Dietrich et al. discusses using matrices when manipulating and solving the mathematical expressions of the constrained resource allocation problem. Using an inverse Cholesky transformation to transform a matrix is well known in the art of matrix algebra and mathematics. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an inverse Cholesky transformation on the matrix of Dietrich et al. in order to reduce costs by more efficiently manipulating and solving the equations of Dietrich et al. By more efficiently solving the equations, run time will be reduced thereby saving costs.

26. As per claim 13, Dietrich et al. teaches a method wherein the demand distribution includes any multivariate demand distribution (See at least figure 8, column 4, lines 15-40, column 8, table 2, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 45-65, column 12, lines 1-20, column 13, lines 1-11 and 32-40). However, Dietrich et al. does not expressly disclose that the multivariate demand distribution is a member of the elliptical family of distributions.

Dietrich et al. discusses manipulating and solving the mathematical expressions representing multivariate constrained resource allocation problems. The elliptical family of

distributions is well known in the art of mathematics. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the elliptical family of distributions in the distributions of Dietrich et al. in order to increase the ability of the tool to meet the needs of the user by adding mathematical features and techniques that are readily used in the word of mathematics.

27. As per claim 15, Dietrich et al. discloses a method wherein the transforming step includes transforming and manipulating a matrix (See at least figure 8, column 4, lines 15-40, column 9, lines 11-31 and 55-65, column 10, equations 1 and 2, lines 5-20 and 26-30, column 11, lines 65-67, column 12, lines 1-20, column 13, lines 1-11 and 32-40). However, Dietrich et al. does not expressly disclose using an inverse Cholesky transformation.

Dietrich et al. discusses using matrices when manipulating and solving the mathematical expressions of the constrained resource allocation problem. Using an inverse Cholesky transformation to transform a matrix is well known in the art of matrix algebra and mathematics. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an inverse Cholesky transformation on the matrix of Dietrich et al. in order to reduce costs by more efficiently manipulating and solving the equations of Dietrich et al. By more efficiently solving the equations, run time will be reduced thereby saving costs.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Anbil et al. (U.S. 6,035,277) teaches producing optimal operational states using iterative linear programming procedures.

Chapman (U.S. 5,291,394) discloses a capacity planning system that plans using available resources in the manufacturing environment.

Deziel et al. (U.S. 5,406,476) discloses a constrained scheduling problem that performs resource allocation.

Ye (U.S. 6,374,227) teaches a resource allocation tool that considers demand and available resources.

Fields et al. (U.S. 5,111,391) discloses a resource allocation system and method that creates a maximized schedule looking at the resources available and the overall needs of the problem.

Hillier et al. (*Introduction to Operations Research*) teaches general operational research procedures for constrained resource problems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Beth Van Doren whose telephone number is (703) 305-3882. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (703) 305-9643. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-7687.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

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November 14, 2003

Romain Jeanty
Art Unit 3623